Rule CIC261: APPC modegroup may have insufficient sessions defined

Finding: CPExpert believes that there may be insufficient sessions defined for an APPC (LU6.2) modegroup.

Impact: This finding should normally have a MEDIUM IMPACT on the performance of the CICS region. However, the finding could have a HIGH IMPACT on the performance of individual transactions if these transactions are queued for lengthy intervals.

Logic flow: This is a basic finding, based upon an analysis of the CICS statistics. Please refer to Rule CIC260 for a discussion of basic ISC/IRC concepts.

Discussion: Transactions acquire the use of a session in an ISC/IRC environment by using the ALLOCATE command. Conversations can take place between the two CICS regions or systems only after the session has been allocated. Once established, the session normally exists for a long time and can be used by many different transactions. The session normally is terminated by a FREE command.

With LU6.2, the ALLOCATE command may request allocation from a specific session modegroup (with its own characteristics), or may not request any particular session modegroup. If a specific session modegroup is requested, CICS will restrict its allocation attempt to that modegroup. If no particular session modegroup is requested, CICS will attempt to allocate a session from any modegroup, but selects modegroups in the order in which the modegroups are defined. Rule CIC262 describes the implications of this allocation process in more detail.

A session must be available in order to be allocated in response to the ALLOCATE command. If a session is not available, CICS will normally queue the allocate request (and suspend the transaction) until a session is made available. Optionally (using the NOQUEUE specification), control can be returned to the transaction which can take application-dependent action based on the unavailability of a session.

Some queuing for allocation requests may be unavoidable because an installation may have deliberately restricted the number of sessions to minimize resource use by CICS. The *CICS/ESA Version 3.3.1 Performance Guide* lists a number of effects potentially caused by increasing the number of sessions:

- The amount of real and virtual storage required to support CICS may increase.

- The use of storage on GATEWAY NCPs in the network may increase.

- The use of storage by VTAM may increase.

- The line loading in the network may increase.

- The back-end CICS system may not be able to cope with increased workload from the front-end system.

- The increased control block scanning by CICS may degrade performance.

In fact, some installations deliberately restrict the number of sessions as a means of controlling the number of CICS tasks (rather than using the TCLASS control method).

The decision of whether to increase the number of sessions should be viewed as a tradeoff between the potential disadvantages, versus the advantages of less task suspension, faster response, shorter transaction life, earlier release of resources, etc.

CPExpert detects the potential problem caused by queuing session ALLOCATE requests for **generic** sessions in Rule CIC160. CPExpert detects the potential problem caused by queuing session ALLOCATE requests for **specific** modegroups in Rule CIC261.

For Rule CIC261, CPExpert performs the following analysis:

- CPExpert evaluates the Peak Outstanding Allocates for the modegroup (A20ESTAM). A20ESTAM contains a count of the maximum number of ALLOCATE requests which were queued by CICS when a session could not be allocated for the modegroup.

  Note that if the NOQUEUE option were exercised by a user, unsatisfied ALLOCATE requests for the modegroup would not be included in this count. Unsatisfied ALLOCATE requests which were returned to the user with a SYSBUSY indicator would be included in Failed Allocates Due to Sessions in Use (A20ESTAO for specific requests). (Please refer to Rule CIC168.)

- CPExpert detects a **potential** problem when the maximum number of queued ALLOCATES for specific modegroup session allocation requests is greater than the **ALLOCQ** guidance variable in USOURCE(CICGUIDE).

The default specification is **ALLOCQ=1**, indicating that Rule CIC261 would be produced if more than one ALLOCATE request could not be satisfied because no sessions were available for a specific modegroup. **This low default value is intended only to alert you to a potential problem with the number of sessions defined, and is intended to make you aware of this analysis mechanism**.

For many installations, the default should be changed after executing the CICS Component a few times. The **ALLOCQ** variable should normally be used to cause CPExpert to signal a problem only when you wish to be informed of abnormal situations. For example, some installations always have a few ALLOCATE requests queued. Occasionally, however, several hundred or even several thousand requests are queued. Analysts at these installations are not concerned about the few queued requests, but are concerned about the situations when hundreds or thousands of requests are queued.

Suggestion: CPExpert suggests that you consider increasing the number of sessions allocated to the modegroup identified as having too few sessions. Please refer to the above discussion to assess whether the number of sessions should be increased.

Alternatively, you may need to change the distribution of contention winners versus contention losers for the modegroup.

Alternatively, you may need to change the order in which the modegroups are defined because of conflicting usage between modegroups. (Please refer to Rule CIC262.)

Alternatively, change the **ALLOCQ** guidance variable to cause CPExpert to signal a potential problem only when you view the problem as serious.

Reference: *CICS/ESA Version 3.1.1 Performance* Guide: pages 76-84.

CICS/ESA Version 3.2.1 Performance Guide: pages 294-301.

CICS/ESA Version 3.3.1 Performance Guide: pages 55-56 and pages 313-320.

CICS/ESA Version 4.1.1 Performance Guide: Section 2.2.23 and Appendix A.1.13.

CICS/TS Release 1.1 Performance Guide: Section 2.2.23 and Appendix 1.1.14.

CICS/TS Release 1.2 Performance Guide: Section 2.2.24 and Appendix 1.1.14.

CICS/TS Release 1.3 Performance Guide: Section 2.2.25 and Appendix 1.1.15.

CICS/TS for z/OS Release 2.1 *Performance Guide*: Chapter 5 (ISC/IRC system and mode entry statistics) and Appendix A (Table 64).

CICS/TS for z/OS Release 2.2 *Performance Guide*: Section 2.2.27 (Interpreting ISC/IRC system and mode entry statistics) and Appendix 1.1.12.

